

Extent of Implementation of Solid Waste Management Program in Bacon District

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Abstract— This study is a qualitative research that center on the assessment of solid waste Management program in Bacon District on the school year 2017-2018. A total enumeration of 184 are the respondents of the study. The study focus on the activities undertaken by the schools, extent of implementation along waste segregation, collection, re-use, reduce, recycle and composting. It includes also the problems met during implementation of the program. Findings reveal that most of the activities undertaken by the schools to implement solid waste management program were conduct on solid waste management campaign, incorporate solid waste management in the lessons and activity that prioritize recycling, reduction and re-use. The extent of implementation along waste segregation is highly implemented while in terms of collection, re-use, reduce, recycle and composting is implemented. The study also reveals shortcomings in connection with the implementation of the program such as lack of facility to process recyclable materials, attitudes and awareness of the pupils when it comes to solid waste management, lack of trainings on recycling and composting of waste, inadequate and insufficient waste collection equipment and lack of resources or fund in maintaining Solid Waste Management Program. A project Waste Management Practices: A key to sustainable Solid Waste Management Program as the output of the study shall be proposing to address the said issues.

Keywords— Solid Waste Management, extent, Bacon District.

INTRODUCTION

Waste is a serious challenge that should be concerned by everyone. To address this challenge, a well formed waste management system is need to eradicate this problem. But as long as development is concerned solid waste problems will escalate. As a saying goes “Waste is like a mirror that reflects various aspects of society”.

When we say society is closely related to economic, culture, environment and other aspects. These aspects depend upon the country, city or community same as the problems in waste. Understanding one’s community or place provides direction to understand the waste problem in a society.

According to the World Bank United States, China, Brazil, Japan and Germany are the leading trash generators. The U.S. produced about 228 million tons of waste in 2006, a figure that climbed to 254 tons by 2013. China with a population around four times larger than that of the U.S. is close behind, with 190 million tons of waste per year.

Caring and managing of global waste is a global concern for the Earth as the population of Earth grows, and places where waste is deposited becomes a problem. Waste of various kinds is a danger to human health, wildlife preservation, and the environment in a broad range of aspects including how waste affects water supplies, soil contamination, and hazardous environments that remain or become uninhabitable. As the human population grows, so does consumption, and with that consumption huge amounts of waste are formed.

Planning and implementing a comprehensive program for waste collection, transport and disposal together with different activities to recycle waste can eliminate these problems. The Environmental Protection Agency reported in the United States 56 million tons or 27 percent of total waste were recovered by recycling. There recycling programs have been operating in full force for years.

Waste Zero promotes a bag-based “pay-as-you-throw” program. Used in more than 800 cities and counties across the country, the program charges residents a set fee in cash for each bag they dispose of at a drop-off location. The program has resulted in an average waste reduction of 44% and often doubles recycling rates.

Properly implemented solid waste management may lead to environment that is free from pollution on air, on land and even in water. Solid waste management must be the concern of everybody because of its direct effect in the environment.

Waste management in the Philippines has been an issue for about two decades now. According to Ramos (2003), the Philippines as a developing country is under pressure from both public and industrial sectors on how to

manage the ever-increasing waste. To address this problem, the Philippine Congress enacted RA 9003 as the Ecological Solid Waste Management Act on July 24, 2000. The Act provides for an ecological solid waste management program, creating the necessary institutional mechanism and incentives, declaring certain Acts prohibited and providing penalties, appropriating funds thereof and for other purposes. This Act mandated the Department of Education (DEPED), Technical Vocational and Skills Development Authority (TESDA), the Commission on Higher Education (CHED) and the Department of Natural Resources (DENR) and other concerned government agencies.

The Department of Education also supported this Act as stated in Deped Order No. 5 series of 2014, to aggressively incorporate ecological solid waste management in the school system at all levels, emphasizing the involvement of School administrators, teaching and non-teaching staff and students in school wide and nearby community waste management actions.

Furthermore, schools shall practice management principles, such as minimization, resource conservation, and recovery, segregation, reduction, recycling, re-use and composting in order to promote environmental awareness and action among the students.

OBJECTIVES OF THE STUDY

This study aimed to assess the extent of implementation of Solid Waste Management Program in Bacon District for the School year 2017-2018. Analysis

of the research were conducted to: 1) determine the activities being undertaken by the schools to implement Solid Waste Management Program; 2) assess the extent of implementation of Solid Waste Management Program in terms of waste segregation, collection, re-use, reduce, recycle, composting; 3) determine the problems met in the implementation of Solid Waste Management Program; 4) develop a plan for sustainable Solid Waste Management Program.

METHODOLOGY

This study uses the descriptive-survey method of research. The main sources of the data are the 184 respondents taken from the different sectors of Bacon District such as Bacon East and West for the school year 2018-2019. The questionnaire-checklist were the main instrument use in gathering the data.

The gathered data through instrument were tallied, analyzed and interpreted. To determine the extent of

implementation waste Management the weighted mean was computed. Meanwhile, ranking was utilized to determine the activities undertaken and the problems met.

RESULTS AND DISCUSSIONS

Solid Waste Management Program Activities

This section contains the discussion of the different activities being undertaken by the school to implement Solid Waste Management Program. It discussed the major activities that is being undertaken by the schools.

Table 2 shows that out of 184 respondents the activities the conduct on Solid waste management campaign got a rank of 2 or a total of 182 respondents agreed on the said activity. Is it maybe because making the people aware of the program is the step to encourage them to participate.

As mentioned by Sabila (2006) about the participation of the administrator, teachers, pupils and parent, it was recommended that to ensure the efficiency and effectiveness of the program, information campaign and re-educate the people about waste management.

Another activity was on incorporate Solid Waste Management in the lessons agreed by the 181 respondents out of 184. Incorporating solid waste in the daily lesson was a priority of the schools because through this method the pupils were engage in the real life situation.

The continues integration will develop awareness among the pupils. The skills and ideas learned in the daily activities help them to become a better person.

This were parallel to the study of Ontoria and Mias, according to them educational institution should take part for sustainable solid waste management program, involvement of the teacher is also essential in attaining holistic development program.

Another activity that is being undertaken by the schools were on prioritize recycling, reduction and re-use agreed by the 176 respondent out of 184. Educating the pupils different ways to reduce, recycle and re-use will encourage them to become a productive person, especially if the output will be recognized by the schools and the barangay.

It must be the priority of the school because through this, waste in the school will slowly eradicated and aside from it schools were teaching the pupils in saving the mother earth.

Table 2: Solid Waste Management Program Activities

Solid Waste Management Program Activities	Frequency of Respondents							
	School Heads N=14	R	Coordinators N=17	R	Advisers N=153	R	Overall N=184	R
1. Conduct solid waste management campaign	14	2	17	1.5	151	1	182	1
2. Incorporate Solid Waste Management in the lessons	14	2	17	1.5	150	2	181	2
3. Conduct waste assessment and survey of the wastes	11	5	13	5	99	5	123	5
4. Prioritize recycling, reduction and re-use	12	4	16	3.5	148	3	176	3
5. Enforce prohibition of littering and burning of waste	14	2	16	3.5	138	4	168	4
6. Conduct recycling competition	8	7	7	6	55	6	70	6
7. Publicize the success/results of the program	9	6	6	7.5	50	7	65	7
8. Conduct waste auditing	7	8	6	7.5	42	8	55	8

Extent of implementation of Solid Waste Management Program

This section contains about the discussion of the extent of implementation of Solid Waste Management in terms of waste segregation, collection, re-use reduces, recycle, composting. Waste segregation. A practices of separating materials found in solid waste in order to

promote recycling and reuse of resources and to reduce the volume of waste for collection and disposal (Republic Act.9003). Table 3. A shows the different indicators that might encounter by the schools to implement Solid waste management in terms of Waste segregation.

Table 3.A: Extent of Implementation of Solid Waste Management Program in terms of Waste Segregation

Waste Segregation	School Heads	Coordinators	Advisers	Overall	Desc.
1. Integrates waste segregation in the lessons.	4.79	4.71	4.54	4.68	HI
2. Teaches proper throwing of garbage to pupils.	4.79	4.94	4.80	4.84	HI
3. Teaches the pupils on how to sort and classify waste.	4.79	4.88	4.80	4.82	HI
4. Avoid littering in the surrounding, pathways, plant boxes and rooms.	4.64	4.88	4.68	4.73	HI
5. Avoid open burning of waste in the school premises.	4.29	4.82	4.53	4.55	HI
6. Availability of storage bin in the school premises.	4.86	4.76	4.78	4.80	HI
7. Rooms have bins color-coded such as green for “nabubulok” blue for “di-nabubulok” and yellow for “naririsiklo”.	4.79	4.71	4.67	4.72	HI
8. Assign school organization/clubs to monitor waste in the school.	4.64	4.53	4.52	4.57	HI
Average	4.70	4.78	4.67	4.71	HI

It can be gleaned from the table that the extent of implementation in terms of Waste segregation, arrived at an average weighted mean of 4.71 described as highly implemented. In particular, it can be seen from the table that all the indicators presented were agreed by the respondents as highly implemented with an overall weighted mean ranging from 4.55 to 4.84. It was found out from the study that the extent of implementation of Solid Waste Management Program in terms of waste segregation was highly implemented. This means that school heads, solid waste management coordinator and advisers prioritize in the school to educate the pupils on

how to throw garbage properly. This implies that this activity should continue to integrate to their lessons to support solid waste management program.

Waste Collection. It is the act of removing solid waste from the source or from a communal storage point (Republic Act, 9003). It refers also to the process of collection of waste inside the classrooms and transporting it to its designated areas. In the Table 3. B shows different activities that will encounter by the schools in implementing Solid Waste Management in terms of waste collection.

Table 3.B: Extent of Implementation of Solid Waste Management Program in terms of Waste Collection

Collection	School Heads	Coordinators	Advisers	Overall	Desc
1. Waste collection is regular and systematic.	4.00	4.12	4.07	4.06	I
2. Sets appropriate time for collection.	3.85	4.11	4.00	3.99	I
3. Appropriate containers in collecting wastes inside the classrooms were use.	4.50	4.65	4.48	4.54	HI
4. Collects the waste material separately.	4.29	4.35	4.20	4.28	I
5. Biodegradable waste collected were thrown directly in the compost pit.	4.50	4.35	4.25	4.37	I
6. Schools have storage for waste collected.	4.29	4.44	4.00	4.24	I
7. Waste collectors visit/drop by in the school to collect garbage.	4.29	4.00	3.82	4.03	I
8. Conduct monitoring on collection activities.	4.00	4.00	3.93	3.98	I
Average	4.22	4.25	4.09	4.19	I

As shown in the table below the extent of implementation of Solid Waste Management in terms of waste collection were implemented with an average weighted mean of 4.19. The highest weighted mean of 4.54 were given to the statement on appropriate containers in collecting wastes inside the classrooms were use describe as highly implemented. While the seven indicators were rated as implemented with an average ranging from 4.28 to 3.98. Results revealed that the school heads, solid waste management coordinator and the adviser agreed that in terms of waste collection, the schools provide an appropriate container to collect waste inside the classrooms. This means that it is the priority of the schools to provide a container for each classrooms for collection of waste so that the pupils will be able to throw their garbage properly and segregated.

Re-use. It refers to the process of recovering materials intended for the same or different purpose without alteration of physical and chemical characteristics (Republic Act no.9003). Table 3. C shown different activities that might encounter in implementing Solid Waste management in terms of re-use. As shown in the table the indicators that teach the pupils ways in re-using papers, plastic and utilize used bond paper as a scratch paper/scrap pad gain the highest weighted mean 4.53 described as highly implemented. This means that the school provide through education the different ways in re-using of paper, plastic and other materials. They believe that teaching those ways in reusing waste will develop their sense of responsibility, resourceful and being creative.

Table 3.C: Extent of Implementation of Solid Waste Management Program in terms of Reuse

Reuse	School Heads	Coordinators	Advisers	Overall	Desc
1. Encourage the pupils to re-use in different ways.	4.43	4.47	4.50	4.47	I
2. Teach the pupils ways in re-using papers and plastic	4.50	4.65	4.44	4.53	HI
3. Encourage the pupils to bring lunch/snacks using reusable materials.	4.07	4.06	4.16	4.10	I
4. School canteen re-use plastic containers and utensils.	4.14	4.24	4.16	4.18	I
5. School uses empty cans and bottles for plants and ornamentals.	4.57	4.35	4.54	4.49	I
6. Utilize used bond paper as a scratch paper/scrap pad.	4.64	4.50	4.45	4.53	HI
7. Teaches the pupils to turn their old homework into paper mache materials or recycled beds.	4.29	4.31	4.06	4.22	I
8. School use refillable ink cartridges instead of buying new ones.	4.29	4.47	4.38	4.38	I
Average	4.37	4.38	4.34	4.36	I

It was also revealed in the table that the indicators were rated by the respondents ranging from 4.49 to 4.10 with the description of implemented. Hence, the extent of

implementation of Solid Waste Management in terms of re-use with the average weighted mean of 4.36 described as implemented.

Reduce. To make something less in size, amount, degree, importance or price (Republic Act no.9003). As shown in the table the extent of implementation of Solid Waste Management in terms of reduce with an average weighted mean of 4.35 described as implemented. Specifically, two of the eight indicators were identified

by the respondents to be within the description of highly implemented with weighted means of 4.66 and 4.57. These were on educate the pupils using different ways of disposing waste and encourage the pupils to use both sides of notebook pages when taking down notes respectively.

Table 3.D: Extent of Implementation of Solid Waste Management Program in terms of Reduce

Reduce	School Heads	Coordinators	Advisers	Overall	Desc
1. Educate the pupils using different ways of disposing waste.	4.71	4.65	4.61	4.66	HI
2. Schools avoid selling foods that uses plastic.	4.07	4.41	4.13	4.20	I
3. Pupils are encourage to bring their own reusable utensils and dishes.	4.14	4.12	4.13	4.13	I
4. Schools discourage to use straws and other tetra pack packages.	4.21	4.47	4.21	4.30	I
5. Encourage to use biodegradable material in storage of food.	4.14	4.24	4.15	4.18	I
6. Encourage pupils to eat organic food that are packed organically.	4.21	4.24	4.30	4.25	I
7. Encourage the pupils to use both sides of notebook pages when taking down notes.	4.50	4.59	4.61	4.57	HI
8. Use of chalkboards and power point to deliver written instructions.	4.43	4.53	4.48	4.48	I
Average	4.30	4.41	4.33	4.35	I

The rest of the indicators were rated as implemented as pupils are encourage to bring their own reusable utensils and dishes to have the lowest weighted mean of 4.13. This means that the school did not focus their attention to this activity because most of the pupils uses reusable utensils and dishes. They prioritize activities that have a greater impact to reduce waste in the school. This implies that the school should incorporate the ways in reducing waste as part of the system for continuous and sustainable development of the program.

This was asserted by the California School District (2012) that the school should incorporate waste reduction as parts of the school district overall way of

doing business that can provide number of important benefits.

Recycle. It refers to the treatment of used or waste materials through a process of making them suitable for beneficial use and for other purpose (Republic Act, 9003). It shows from the table that the extent of implementation of Solid Waste management in terms of recycling were described as implemented with an average weighted mean of 4.06. The indicators with the statement of integrates recycling in the lessons got the highest weighted mean of 4.70 described as highly implemented.

Table 3.E: Extent of Implementation of Solid Waste Management Program in terms of Recycle

Recycle	School Heads	Coordinators	Advisers	Overall	Desc
1. Integrates recycling in the lessons.	4.79	4.65	4.66	4.70	HI
2. Schools have recycling bulletin board.	3.86	3.53	3.64	3.68	I
3. Schools have step by step guide for recycling.	3.79	3.59	3.63	3.67	I
4. Teach the pupils different ways/methods of recycling.	4.50	4.24	4.22	4.32	I
5. Schools provide recyclable collection containers.	4.07	4.29	4.30	4.22	I
6. Makes useful projects out of empty bottles, cans and papers.	4.36	4.41	4.56	4.44	I
7. School exhibit the product made from recyclable materials.	4.00	3.65	4.13	3.93	I
8. Sells recyclable waste materials.	3.92	3.18	3.42	3.51	I
Average	4.16	3.94	4.07	4.06	I

Composting. This refers to the controlled decomposition of organic matter by microorganism, mainly bacteria and fungi into humus-like product (Republic Act No. 9003). The table reveals that in terms of composting the school heads, solid waste management coordinator and advisers identify the statement on integrates composting in the lessons teaches composting methods to the pupils as described highly implemented with a weighted mean of 4.50 and 4.57 respectively. The rest of the indicators were described as implemented with a weighted mean

that ranges from 3.55 and 4.28. This means that in terms of waste composting the schools provide different activities that aligned with the implementation of Solid Waste Management Program. It implies that when it comes to composting school head, solid waste management coordinator and advisers are knowledgeable enough and willing to share their ideas but when it comes to the activities they have limited activities to provide composting to the pupils.

Table 3.F: Extent of Implementation of Solid Waste Management Program in terms of Composting

Composting	School Heads	Coordinators	Advisers	Overall	Desc
1. Integrates composting in the lessons.	4.79	4.47	4.44	4.57	HI
2. Teaches composting methods to the pupils.	4.79	4.47	4.25	4.50	HI
3. Schedule a classroom program for a compost demonstration.	4.07	3.25	3.47	3.60	I
4. Set up a compost bin or pile outside the schoolyard or garden.	4.29	4.12	4.31	4.24	I
5. Make compost out of organic waste materials.	4.57	3.94	4.03	4.18	I
6. Use the organic wastes as fertilizer for the gulayan.	4.50	4.12	4.22	4.28	I
7. Provides training for everyone to adds materials to the compost.	4.00	3.12	3.52	3.55	I
8. Schools have signage's/picture for what can and cannot be composted.	4.29	3.35	3.71	3.78	I
Average	4.41	3.86	3.99	4.09	I

Problems met in the implementation of Solid Waste Management Programs

Table 4 presents the problems met in the implementation of Solid Waste Management Program. As shown in the table the major problems met during the implementation of the program are lack of facility to process recyclable

materials with a rank of 1 and a frequency of 130. This means that the school heads, solid waste management coordinator and the advisers identified that lack of facility to process recyclable materials as one of the major problem in the implementations of solid waste management program.

Table 4: Problems Met in the Implementation of Solid Waste Management Program

Problems	Frequency of Respondents							
	School Heads N=14	R	Co or. N=17	R	Advis. N=153	R	Overall N=184	R
1. Lack of knowledge to classify waste materials as to biodegradable, non-biodegradable, and recyclable.	7	6.5	6	8	25	1	38	1
2. Lack of resources or fund in maintaining SWMP.	8	4	9	4	85	5	102	5
3. No regular collection of wastes materials.	8	4	9	4	73	7	90	7
4. Inadequate and insufficient waste collection equipment.	5	8.5	11	1.5	89	4	105	4
5. Lack of trainings on recycling and composting of waste.	8	4	9	4	102	3	119	3
6. Lack of facility to process recyclable materials.	12	1	11	1.5	107	1	130	1
7. Lack of facility for composting.	7	6.5	8	6.5	79	6	94	6
8. Lack of bins and storage of waste in the surrounding.	3	10	4	9	34	9	41	9
9. Insufficient school campaign efforts.	5	8.5	3	10	43	8	51	8

10. Attitudes and awareness of the pupils when it comes to solid waste management.	9	2	8	6.5	104	2	121	2
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This implies that the school heads, solid waste management coordinator and the advisers need to provide facility for enable to process recyclable materials in the schools. It was followed by the indicators on attitudes and awareness of the pupils when it comes to solid waste management. This means starts from the home the child should be nurtured and practice the proper way of handling the waste so that when they go outside their homes, they applied what they have learned. When it comes to awareness, it is the duty of the schools to provide information and activities for them to be aware about waste management. Lack of trainings on recycling and composting of waste was identified problem met in the implementation of solid waste management. As the saying goes, what can you give if you do not have, so it is the vital role of the educator to equipped knowledge and acquire new skills for them to be updated and have something to share to their pupils, co-teachers and stakeholders through trainings and seminar. It was also recommended in the study conducted by Retoma to improve the level of awareness of the school heads, teachers and PTA officials to attend trainings and seminars about solid waste management program. Inadequate and insufficient waste collection equipment and lack of resources or fund in maintaining Solid Waste Management Program were also a problem identified by the respondents with a frequency of 102 and 105.

Waste Management Practices: A key to sustainable Solid Waste Management Program

This is the proposed plan for the improvement and sustainable development of Solid Waste Management. This project plan focus on the problems met and arises during the implementation of the program. The general objectives of the project were (1) promote awareness among the pupils, teachers and stakeholder (2) to provide sustainable Solid Waste Management Program (3) help in the elimination of waste materials scattered in the surroundings (4) participate and support “Project Ligtas-Eskwela”. The activities were divided into five such as (1) “Basura sa Eskwelahan Malilikayan, Kun Igwa ki Matibay na Laugan” The purpose of this project to establish and construct facility to process recyclable materials in the school to manage waste segregation, disposal and promoting clean surroundings.(2) Hustong Kaaraman Sa Basura, Makakatabang para maging Progresibo ka” to educate the pupils about solid waste management and to change their behavior towards solid waste.it provide trainings

and workshop for School Heads, Solid Waste Management coordinator, and teachers to be updated of the trends in composting, reducing, re-use and recycling of waste. (3)“ Basurahan: Satuyang Atamanon asin Padakulon para Maski Saen Basura mo Sasaluhon” to provide adequate numbers of bins for collection and storage of waste (4) “Seminar Asin Worksyap sa Makabagong Paagi sa Pagproseso Kan Basura” To provide trainings and workshop for School Heads, Solid Waste Management coordinator, and teachers to be updated of the trends in composting, reducing, re-use and recycling of waste.(5)“ Basura mo gibuhon kong Kapakipakinabang, Para Eskwelahan Satuyang Matabangan” to create an income generating fund for the maintenance of solid waste management program. Each project will be evaluated and make a terminal report after each activity.

CONCLUSION AND RECCOMMENDATION

It was concluded that the majority of the activities undertaken by the schools to implement Solid Waste Management Program in Bacon District were on the conduct on solid waste management campaign were on incorporate solid waste management in the lessons; prioritize recycling, reduction and re-use and the activities to conduct waste auditing. The extent of implementation of solid waste management in Bacon District along waste segregation is highly implemented, along waste collection, re-use, reduce, recycle and composting the rating is implemented. There were problems met on the extent of implementation of solid waste management program. Foremost of these problems were: Lack of facility to process recyclable materials; Attitudes and awareness of the pupils when it comes to solid waste management; Lack of trainings on recycling and composting of waste; Inadequate and insufficient waste collection equipment and lack of resources or fund in maintaining Solid Waste Management Program. A work plan is proposed to improve and sustain the implementation of solid waste management programs.

This study is an eye opener to the all the concerned individuals to make a sustainable plan for a long term Solid Waste Management Program. Furthermore, Deped should provide more training and seminars for the school heads, SWMP coordinator and advisers especially on re-use, reduce, recycling and composting for them to be updated of the new trends of theses process. School managers should coordinate with the Deped to provide the facility needed for implementation

of solid waste management program. This facility will be used for storage of the discarded materials and waste while waiting for disposal. It is worthy if the government and other non-government organization should be tapped in the improvement of solid waste management program. Finally, the proposed work plan be adopted and implemented and further research on solid waste management could be conducted to validate the findings of the study.

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